LYNCHBURG CITY COUNCIL
Agenda Item Summary

MEETING DATE: **June 10, 2003 Regular** AGENDA ITEM NO.: 16

CONSENT: REGULAR: **X** CLOSED SESSION: (Confidential)

ACTION: **X** INFORMATION:

ITEM TITLE: **Water System Backflow Prevention Program**

RECOMMENDATION: Approve the water system backflow prevention program and adopt the attached ordinance enacting changes in the City Code effective July 1, 2003.

SUMMARY: An approved backflow prevention program is required as a condition for the issuance and continued use of the State operation permit issued to the City of Lynchburg waterworks. The purpose of this program is to maintain the integrity of the water system to deliver potable water by preventing the backflow of delivered water back to the distribution system, which may be contaminated and rendered unfit as potable water.

The City has previously adopted the required Virginia Uniform Statewide Building Code (13 VAC5-61) for new construction, which includes provisions for backflow or backsiphonage prevention devices for certain types of facilities. The proposed program will provide in City Code, Chapter 39, Water, that existing facilities that are defined to be a potential hazard be required to install and maintain the necessary backflow prevention devices. These devices will need to be inspected and tested annually to ensure continued proper operation as outlined in the Backflow Prevention Program. A private certified firm engaged by the facility would test the devices. The estimated annual testing fee ranges from $130 to $175 for a 1inch to 3 inch backflow prevention device. Larger devices are usually tested on an hourly rate.

The program will identify facilities and activities that pose a threat to the public water supply in accordance with Virginia Department of Health regulations. These facilities and their potential hazards are included in the attached Cross Connection and Backflow Prevention Program.

While the ordinance would be effective on July 1, 2003, the enforcement of violations and penalties would not begin until July 1, 2004.

PRIOR ACTION(S): February 25, 2003 Work Session- Program reviewed by City Council

FISCAL IMPACT:

Total program cost of $129,153 (first year) has been included in the Utilities Water operations budget for FY 04. Continuing program cost is estimated to be $100,858 per year. No new City fees are proposed to support this program.

CONTACT(S):
Timothy Mitchell, Acting Director of Utilities, 847-1322 ext. 112
Bruce McNabb, Director of Public Works, 847-1823

ATTACHMENT(S):
Cross Connection and Backflow Prevention Ordinance
Cross Connection and Backflow Prevention Program

REVIEWED BY: lkp

ORDINANCE

AN ORDINANCE TO AMEND AND REENACT THE CODE OF THE CITY OF LYNCHBURG, 1981, BY ADDING THERETO A NEW ARTICLE CONTAINING SECTIONS 39-97 THROUGH 39-104, THE NEW SECTIONS RELATING TO CROSS-CONNECTION AND BACKFLOW PREVENTION, AND BY REPEALING SECTIONS 39-14 AND 39-15, THE REPEALED SECTIONS RELATING TO THE REPAIR OF WATER METERS AND THE PROTECTION OF THE WATER SYSTEM FROM CONTAMINANTS.

BE IT ORDAINED BY THE COUNCIL OF THE CITY OF LYNCHBURG:

1. That Chapter 39 of the Code of the City of Lynchburg, 1981, be and the same is hereby amended and reenacted by adding thereto Article VI., Sections 39-97 through 39-104 as follows:

ARTICLE VI. CROSS-CONNECTION AND BACKFLOW PREVENTION

Sec. 39-97. Definitions.

For the purposes of this article, the following terms shall have the following meanings:

(a) Backflow: The reversal of the normal flow of water or other fluids, mixtures or substances through the distributing pipes of the water system because of an increase in the downstream pressure to a rate that is higher than the supply pressure.

(b) Backflow preventer: Equipment or measures that are designed to prevent backflow or back-siphonage, such as airgaps, reduced pressure principle devices, double check valve assemblies, pressure vacuum breakers and residential dual check valves.

(c) Back-siphonage: The reversal of the normal flow of water or other liquids, mixtures or substances through the distributing pipes of the water system because of negative pressure from a vacuum or partial vacuum in the pipes that supply water.

(d) Cross-connection: Any physical connection between a potable water supply and waste pipe, soil pipe, sewer drain or unapproved source or system, including any potable water supply outlet which is submerged or can be submerged in wastewater or any source of contamination.

(e) Director: The Director of Utilities or any person designated to act on the director's behalf.

(f) Owner: The owner, occupant or tenant of a building or structure.

(g) Plumbing fixtures: Receptacles, devices or appliances that are installed to supply, receive or discharge water or wastewater.

(h) Plumbing system: Water supply and distribution pipes, plumbing fixtures, traps, soil, waste and vent pipes, building drains, building sewers, water-treating and water-using equipment and connection devices and appurtenances that supply water to a building and that are located on the property where the building is located.

(i) Pollution: The presence of any foreign substance in water that tends to degrade its quality.

(j) Water, potable: Water that is free from impurities in amounts that are sufficient to cause disease or harmful physiological effects and that contains bacteriological and chemical qualities which conform to the requirements of the Department of Health's Virginia Waterworks Regulations and of the city.

(k) Water, nonpotable: Water that is not safe for human consumption or that is not potable.

Sec. 39-98. Requirements for backflow and cross-connection control.

Every building and structure shall be constructed, equipped and maintained to prevent the pollution of the city's water supply from cross-connection, backflow or back-siphonage of liquids.

Sec. 39-99. Cross-connection prohibited.

(a) The city's potable water supply system shall be designed, installed and maintained to prevent nonpotable liquids, solids or gases from being introduced into the potable water supply through cross-connections or any other pipe connections to the system.

(b) No person shall permit a cross-connection between the city's potable water supply system and other systems or equipment that contains water or other substances except when the director, or his/her designee, approves the cross-connection and the person has installed protective devices that have been approved by the director, or his/her designee.

Sec. 39-100. Measures to prevent backflow or back-siphonage.

The owner shall install and maintain a backflow preventer, approved by the director, or his/her designee, on all fixtures, equipment and outlets where backflow or back-siphonage may occur. The owner shall install and maintain a backflow preventer on the water service line when the director, or his/her designee, determines that a backflow preventer is necessary to protect the water supply from backflow or back-siphonage.

Sec. 39-101. Prevention devices to comply with rules and regulations.

All cross-connection or backflow prevention devices or systems shall be designed, installed and maintained in accordance with the following manuals: Cross-Connection Control Manual, U.S. Environmental Protection Agency, Office of Water Programs, Water Supply Division; the Virginia Uniform Statewide Building Code; article 3 of the Virginia Waterworks Regulations; and the City of Lynchburg Cross-Connection and Backflow Prevention Control Program. Copies of each manual shall be filed with the director of utilities, or his/her designee, and shall be made available to any owner who requests to see them.

Sec. 39-102. Responsibility of the director.

(a) The director, or his/her designee, shall inspect the plumbing system of every building or structure so as to determine that the plumbing system has been installed to prevent the possibility that the city's water supply will become polluted by cross-connection, backflow or back-siphonage.

(b) The director, or his/her designee, shall have the right to enter any building or structure during reasonable hours for the inspection of the plumbing system for cross-connection, backflow or back-siphonage. The owner shall furnish the director, or his/her designee, with all the information he requests regarding the plumbing system for the property.

Sec. 39-103. Violations.

(a) The director of utilities, or his/her designee, shall send a notice of violation by certified mail to the owner of any building or structure that is found to be in violation of this article. The director, or his/her designee, shall establish a reasonable deadline in the notice of violation for the owner to correct the violation. If the owner fails to correct the violation before the expiration of the time given by the director, or his/her designee, the director, or his/her designee may terminate water service to the building or deny water service to the building.

(b) If a backflow prevention device is removed or bypassed, if a cross-connection exists or if the pressure in the water system is lowered below ten psi gauge, the director, or his/her designee, shall take whatever actions he finds necessary to ensure that the water system is safe from pollution.

Sec. 39-104. Penalty.

It shall be unlawful and a class 2 misdemeanor for any person to knowingly permit a violation of this article to remain uncorrected after the expiration of the time that the director, or his/her designee, provided for correcting the violation. Each day that the violation continues shall be a separate violation and shall be subject to the penalty provided by this section.

2. That the Code of the City of Lynchburg, 1981, be and the same is hereby amended by repealing Sections 39-14 and 39-15.

3. That this ordinance shall become effective July 1, 2003.

Adopted:

Certified: _____
Clerk of Council

104L

City of Lynchburg
Department of Public Works
Utilities Division

Cross-connection Control

And

Backflow Prevention

Program

July 1, 2003

City of Lynchburg
Department of Public Works
Utilities Division

Introduction

Cross-connection Control
and
Backflow Prevention Program

The City of Lynchburg Department of Public Works, Utilities Division is responsible for providing water and wastewater service to the customers of the City of Lynchburg. It is our obligation to insure the health, safety and welfare of our customers by making a continuous effort to provide quality services. The focus of this document is to assure the protection of water quality through the water distribution system to our customers.

Water suppliers must identify potential cross-connection hazards and determine necessary protective measures to maintain water quality. This can be accomplished through the Cross-Connection and Backflow Prevention Program. The program identifies those activities which pose a threat to the public water supply through cross-connections and outlines appropriate protective measures.

It is the purpose of this document to communicate the requirements of this program for protecting our water supply. If you have any questions concerning the Cross-Connection Control and Backflow Prevention, please contact the City of Lynchburg's Cross-Connection Coordinator at (434) 847-1322 or write to:

City of Lynchburg
Public Works Department, Utilities Division
525 Taylor Street
Lynchburg, Virginia 24501

Cross-connection Control

And

Backflow Prevention Program

Required Installations
And
Hazard Identification

July 1, 2003

TYPICAL BACKFLOW PREVENTION DEVICE INSTALLATIONS:

When a degree of hazard has been determined and the property classified, effective steps shall be taken to require correction of the condition or the installation of a backflow prevention device.

1. An air gap separation or an approved reduced pressure zone (RPZ) backflow prevention device shall be installed where contamination hazards are found or potentially exist. Examples of such facilities would be hospitals, funeral homes, veterinary clinics, car washes, chemical plants, etc..
2. An approved double check valve (DCV) backflow prevention device shall be installed where pollution hazards are found or potentially exist. An example would be a fire service system. Fire service systems where chemicals are added, such as antifreeze or foaming agents, shall be equipped with a RPZ.
3. Pressure type vacuum breakers (PVB) shall be installed on bottom fed tanks and vessels. Pressure type vacuum breakers are often installed on lawn irrigation/sprinkler systems. This device must be installed 12" (1 foot) above the highest sprinkler head.
4. Hose bibb vacuum breakers shall be installed on all threaded hose bibbs. Trucks using portable hydrant meters shall be equipped with an approved air gap arrangement or provide a RPZ backflow prevention device on the fill line.

Required Installations:

1. General

An approved backflow prevention device shall be installed on each service line to a consumer's water system serving, but not necessarily limited to, the following types of facilities:

a) Hospitals, mortuaries, clinics, veterinary clinics, nursing homes and medical buildings.

b) Laboratories

c) Piers, docks, water front facilities

d) Sewage treatment plants, sewage and storm water pumping stations

e) Food, beverage processing plants

f) Chemical plants, dyeing plants, and pharmaceutical plants

g) Metal plating industries

h) Petroleum or natural gas processing and storage plants

i) Fire systems

j) Car washes and laundries

k) Lawn sprinkler systems

l) Slaughter and poultry processing plants

m) Commercial greenhouses

n) Paper products plants and printing plants

o) Pesticide and exterminating companies

p) Schools and colleges

q) High-rise buildings (4 or more floors)

Required installations cont.

r) Multi-use commercial, office or warehouse facilities

s) Others specified by the Director of Utilities when reasonable cause can be shown for a potential cross-connection or backflow hazard.

CROSS-CONNECTION, HAZARDS FOUND, RECOMMENDED TYPE OF PROTECTION

Facility	Hazards Found	Type of Protection
A. Hospitals, mortuaries, clinics, veterinary clinics, nursing homes, medical buildings	Bedpan washers, flush valve toilets, autoclaves, specimen tanks, aspirators, autopsy and mortuary equipment, etc.	Air-gap separation or RPZ backflow device on the service connection.
B. Laboratories	Autoclaves, specimen tanks, lab equipment, chemical, bacteriological vessels, etc.	Air-gap separation or RPZ backflow device on the service connection.
C. Piers, docks, waterfront buildings	Auxiliary water, raw water connections, steam boilers, mud pumps, oil and gas tanks, reservoirs, etc.	Air-gap separation or RPZ backflow device on the service connection.
D. Sewage treatment plants, sewage and storm water pumping stations	Sewage pumps, sewage sump ejectors, laboratories, chemical storage, etc.	Air-gap separation or RPZ backflow device on the service connection.
E. Food, beverage processing plants	Cookers, autoclaves, tanks, fill lines, steam connected facilities, chemicals, cleaning equipment, etc.	Air-gap separation or RPZ backflow device on the service connection. Double check device when there is pollution hazard only.
F. Chemical plants, dyeing plants, pharmaceutical, plants	Chemical tanks, vessels, fill lines, Industrial fluid lines, storage reservoirs, fire foam equipment, etc.	Air-gap separation or RPZ backflow device on the service connection.
G. Metal plating industries	Industrial fluid lines, metals in solutions, cyanic, cleaning equipment, tanks, vessels, reservoirs, etc.	Air-gap separation or RPZ backflow device on the service connection.
H. Petroleum, natural gas processing or storage plants	Steam boilers, mud pumps, tanks, vessels, industrial fluid lines, fire foam equipment, etc	Air-gap separation or RPZ backflow device on the service connection.
I. Fire service systems	Sprinkler systems, foam systems, tanks, auxiliary water, anti-freeze, chemicals, pumps, pumper connections, etc.	Air-gap separation or RPZ backflow device on lines that are chemically treated. Double check backflow device on wet Type sprinkler systems.
J. Car washes and commercial laundries	Soap, wax aspirating equipment, reclaimed water lines, fill and feed lines, etc.	Air-gap separation or RPZ backflow device on the service connection.

K. Lawn sprinkler systems	Submerged outlets, chemicals, pumps, stagnant or polluted water, ground water, etc.	RPZ device on lines that are connected to chemicals. A PVB device on wet systems must be 1' (one foot) above highest head.
L. Slaughter or poultry processing plants	Industrial fluid lines, cleaning, bleaching, chemicals, wastes, etc.	Air-gap separation or RPZ backflow device on the service connection.
M. Commercial greenhouses	Chemical, fertilizer-aspirating equipment, sprinkler lines, reservoirs, tanks, vessels, etc.	Air-gap separation or RPZ backflow device on the service connection.
N. Paper products, printing plants	Auxiliary waters, tanks, chemicals, industrial fluid lines, fill lines, bleaches and dyeing, etc.	Air-gap separation or RPZ backflow device on the service connection.
O. Pesticide or exterminating plants	Chemicals, aspirators, hose connections, tanks, fill lines, industrial fluid lines, etc.	Air-gap separation or RPZ backflow device on the service connection.
P. Schools, colleges	Biological labs, flush valve toilets, specimen tanks, reservoirs, cooling towers, autopsy and morgue equipment, etc.	Air-gap separation or RPZ backflow device on the service connection.
Q. High rise buildings (4 or more floors)	Multiple services, change of occupancy, flush valve toilets, pumps, cooling towers, steam boilers, etc.	Air-gap separation or RPZ backflow device on the service connection.
R. Multi-use commercial, office or warehouse facilities	Multiple services, change of occupancy, internal looping of lines, industrial fluid lines, etc.	Air-gap separation or RPZ backflow device on the service connection.

Cross-connection Control

And

Backflow Prevention Program

Elements of the Program
Inspections and Maintenance

July 1, 2003

ELEMENTS OF THE PROGRAM

The basic elements necessary to perform the program are:

1. An inspection program to determine the need for and require control measures on existing connections to the City's water system;

2. A testing program to determine the operational effectiveness of devices installed on existing connections to the City's water system;

3. A procedure for review of plans for new or modified connections to the City water system to determine the need for and require control measures, as necessary;

4. A system for maintaining records for the program including inspection, devices installed, tests, etc;

5. Personnel, equipment, supplies and organization to perform the above functions.

INSPECTION PROGRAM FOR EXISTING WATER CONNECTIONS:

The Cross-connection Inspector is responsible for inspection of waterworks for cross-connections and backflow prevention control. The Cross-connection Inspector manages and promotes the program and performs inspections. The Inspector must be thoroughly trained in the detection and effects of cross-connections and in the use and function of backflow prevention devices.

INSPECTIONS AND MAINTENANCE

1. Inspections will be scheduled in priority according to known degree of hazard associated with the type of customer being served. Services with a high degree of hazard will be inspected first. Others shall come in order.

   Residential customers will be informed of potential cross-connections in and around the home through educational brochures and other information sent periodically in utility bills.

2. Inspections and tests on backflow prevention devices that are required and installed shall be made annually. Tests shall be performed by a certified tester. Devices will be repaired, overhauled or replaced as directed by the Department of Public Works, Utilities Division. Overhaul intervals should be by the manufacturer's recommendations.

3. Certified test results shall be furnished to the Department of Public Works, Utilities Division and the results will be maintained on file for a period of five (5) years.

4. Certified testers must furnish proof of certification to the Utilities Division including certifying agency and expiration of certification.

5. Testing procedures shall be in accordance with the manufacturer's instruction and approved by the Department of Public Works, Utilities Division.

Cross-connection Control

And

Backflow Prevention Program

Site Plan Review

July 1, 2003

SITE PLAN REVIEW PROCESS

1. Prior to construction and issuance of any building permits, site plans must be submitted to the Technical Review Committee and approved by the Department of Public Works, Utilities Division.

2. The location of any backflow prevention device shall be shown on the site plan.

3. Existing plumbing from the building to the connection and/or water meter must be shown. Proposed plumbing from the building to the connection must be shown.

4. When the site plan reflects the installation of a backflow prevention device, such devices shall be of an approved type and shall be tested by a recognized testing laboratory or agency and be approved by the Department of Public Works, Utilities Division. A list of approved backflow prevention devices is included in this document.

5. The Department of Public Works, Utilities Division shall review the plans and advise whether they are approved or disapproved. If disapproved, the Department of Public Works, Utilities Division will advise what will be approved. The revised plan shall be resubmitted for additional review.

6. If an underground fire system is proposed, the site plan must show the proposed water line tie-in and the proposed location of the double check valve assembly (DCV).

7. If an underground irrigation system is proposed, the site plan must show the proposed water line tie-in and the location of the pressure type vacuum breaker (PVB) or reduced pressure zone (RPZ) backflow device.

Cross-connection Control

And

Backflow Prevention Program

Fire System Requirements

July 1, 2003

Fire System Service Requirements

1. All fire sprinkler system services will be equipped with an approved double detector check valve assembly to ensure protection of the City water supply from contamination. Maintenance responsibility of the Utilities Division will end immediately preceding the inlet gate valve of the assembly or at the City right of way line. The assembly, valves, fire department connection and the vault shall be maintained by the property owner.

2. The Department of Public Works, Utilities Division will perform plan review of the proposed water line extension up to the first outside stem and yoke (OS&Y) gate valve located on the inlet side of the double detector check valve assembly and the plan review of the assembly as it relates to the backflow device, etc. The Engineer shall provide details illustrating the type of anchoring that will be used on the inlet side OS&Y valve so that the valve will not blow off when the double detector check valve assembly is removed.

3. The Building Official will review from the inlet side OS&Y gate valve of the double detector check valve assembly to and including the building. A separate plan submission is required for the Building Official's approval.

4. The vault shall be located on the owner's property at or as near to the property line as possible and out of the main flow of traffic.

5. The vault shall be designed and constructed in accordance with the City's Standard Details.

6. The location will be reviewed by both the Department of Public Works, Utilities Division and the Building Official for optimum placement. The review of the site plan is not a detailed review of the water and sewer design when it involves the relocation and/or extension of the City system. However, the site plan (applicable sheets of the site plan) must reflect the approved water and sewer design and show the exact location of the existing facilities. It is important that the Engineer submit utilities plans directly to the Technical Review Committee at the same time or near that time to avoid unnecessary delays in the approval of the site plan and the release of the building permit.

7. Installation of double detector check valve assemblies other than at the property line must be approved by the Utilities Division and the Building Official. In these instances a gate valve will be installed at the property line and/or edge of the water line easement to designate the point at which the Utilities Division's responsibility ends.

8. When a Siamese connection is required, it will be installed on the outlet side of the double detector check valve assembly.

Service and Vault Installation Policy

July 1, 2003

City of Lynchburg
Public Works Department
Utilities Division

Service Installation and Vault Policy

Domestic Services ¾" through 2"

The City will make an appropriate size tap to the existing water main and install the copper service pipe from the tap to the meter box. The City will install the meter box at the right of way or easement line. In locations where a public sidewalk exists the meter box will be installed in the sidewalk. The meter assembly and meter will be furnished and installed by the City, including a pigtail on the property owner's side of the meter. The pigtail shall extend approximately 18" beyond the meter box and shall be used for the owner to connect to the service. The City's maintenance responsibility for the service shall end at the end of the pigtail.

Domestic Services 3" and Larger

The City will make an appropriate size tap/connection to the existing water main and install ductile iron pipe to the approximate location of the proposed vault. The property owner shall have the vault constructed to City standards including the by-pass line around the vault and piping inside the vault. The City shall inspect all pipe work prior to backfilling. Upon approval of the completed vault installation, the City will assume responsibility for the maintenance of the service line, the by-pass line, the vault and contents. The City's responsibility shall end at the downstream tee of the by-pass line. The vault and the by-pass line shall be constructed within the street right of way. If there is not enough space to install the vault and by-pass within the right of way, the City shall be granted an easement for any portion of the installation outside of the right of way. The property owner shall be responsible for preparing and recording the easement.

Per City Code Sec.39 – 41, services used for domestic or manufacturing purposes must be independent of services used for fire systems.